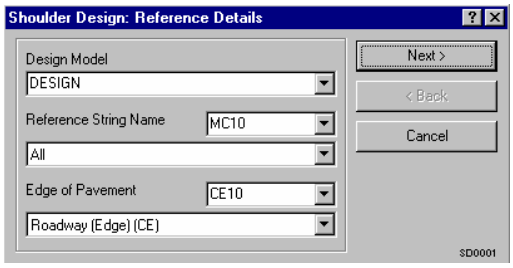
Chapter 11 Create Shoulders, Curbs, Sidewalks, etc.

Creating Shoulders for Superelevated Roadways

We can now add our shoulders to mainline and side roads. This could have been done earlier for the mainline roadway, but waiting a bit provides for a less cluttered display during the intersection design, and makes it easier to pick edge of traveled way strings. The side roads should definitely have been left until now however, as it will allow us to create shoulders that continue through the curb return as it's now one string label.

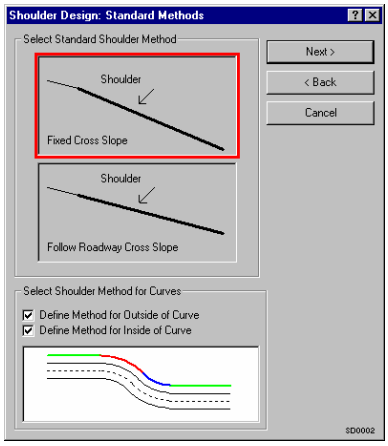
Step 1: Determine whether your superelevation exceeds R/C conditions. If it *does not*, then you can simply apply a constant-slope shoulder, curb, sidewalk design template by clicking ***Design, Road Design, Curbs Shoulders and Sidewalks*** from the Menu Bar and skip to Section K. If it *does* exceed R/C conditions, then you should follow the remaining steps in this section.

Step 2: Select ***Design, Road Design, Shoulder Design*** from the Menu Bar. This will produce the following panel:



Select the Design Model, Reference String Name, and Edge Of Pavement Name for the side you want to put the first shoulder on. Click on ***Next*** to continue.

Step 3: The following panel will appear:

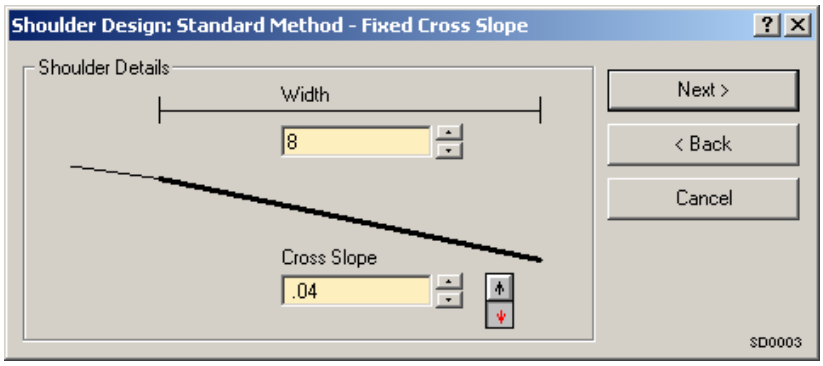


Select whether you want a fixed cross slope, or you want the cross slope to follow the roadway (for normal shoulder cross slope) by choosing one of the two diagrams.

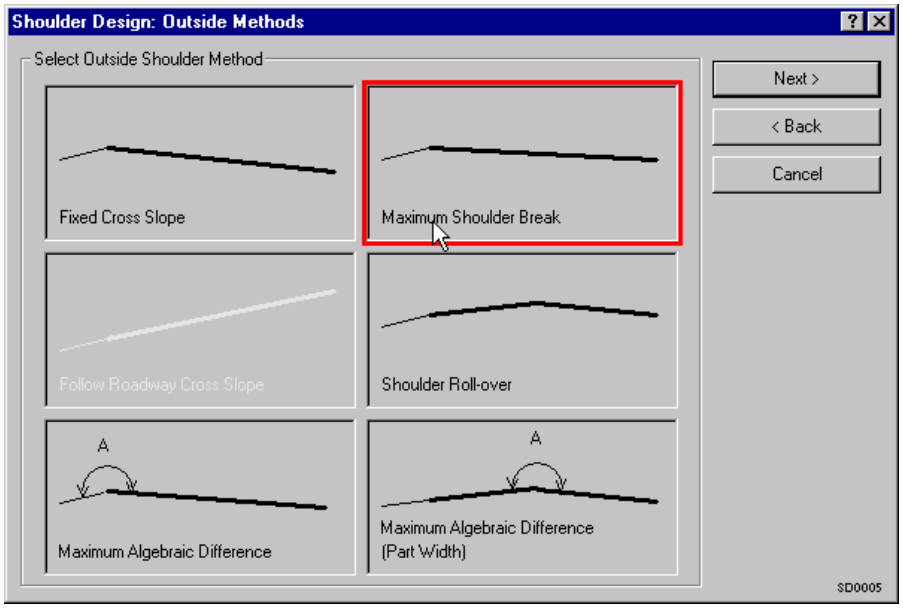
If you want to define a rule to deal with the outside and inside of curves, then check both boxes on the bottom part of the panel. (Do this!).

Click ***Next*** to continue.

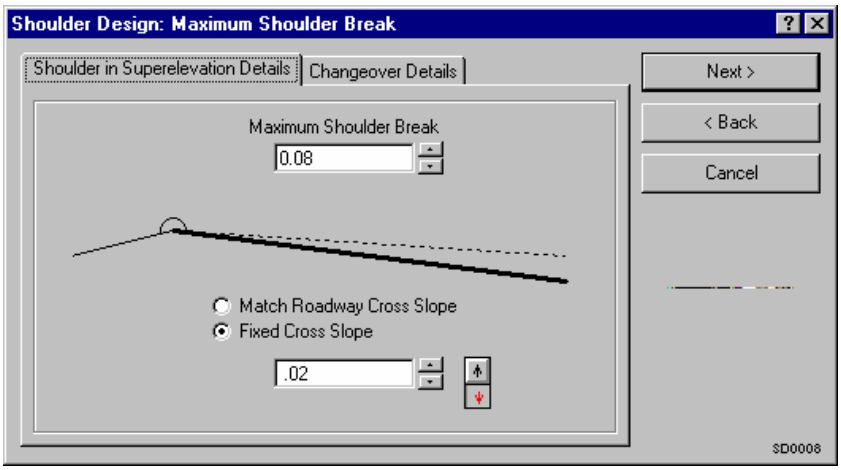
Step 4: Define the normal shoulder width and cross slope.



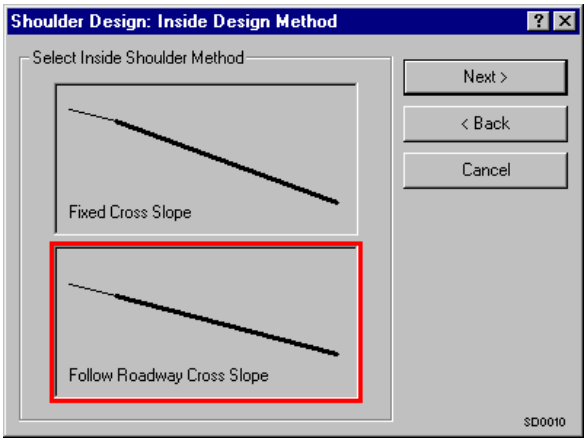
Step 5: Select the Method of adjusting outside curve shoulder



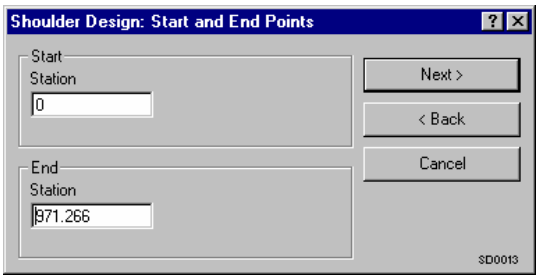
Step 6:
Define Maximum Shoulder Break conditions:



Step 7: Select the Inside Curve Shoulder Method:



Step 8: Define station limits to apply shoulders to.



And click ***Next*** to create the shoulder string.

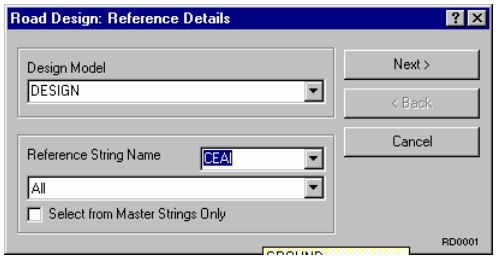
Step 9: Repeat Steps 2 through 8 for other side of mainline roadway. It should be noted here that the content of the panels in these wizards will vary depending on which methods you are selecting. The ones in this manual are here for illustrative purposes, and you'll likely want to experiment on your own.

Any curb, esplanade, or sidewalk, or berm strings that need to be created can be either built manually, or by following the procedure illustrated in this next section, which we'll use to apply shoulder, curb, and sidewalk to our side road.

Shoulder, Curb, and Sidewalk Design - R/C or Less.

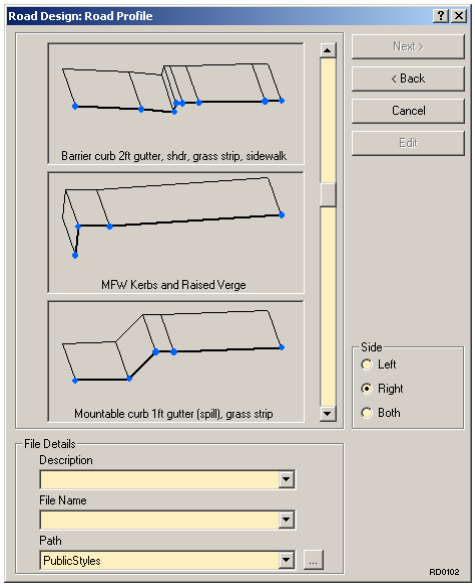
It can be a bit confusing having two tools to create shoulders with, but following the steps in this section will allow you to quickly generate gutter lines, curb strings, esplanades, and sidewalk strings when superelevation shoulder breaks are not a concern.

Step 1: Select ***, Road Design, Curbs Shoulders and Sidewalks*** from the Menu Bar. The following Panel will appear:



NOTE: The reference string which you choose does NOT have to be an M-String. When we created our curb returns for the intersection in MXRoad, the side road edge of traveled way and the curb return were joined on each side. *In this procedure, you should select the edge of traveled way for the side road as the reference string*.

Step 2: Select which template to apply from the edge of traveled way.



To use this panel, select the file containing the features that you want to apply, from the File Details boxes. The diagrams above these should change depending on which shoulder/curb style file is used.

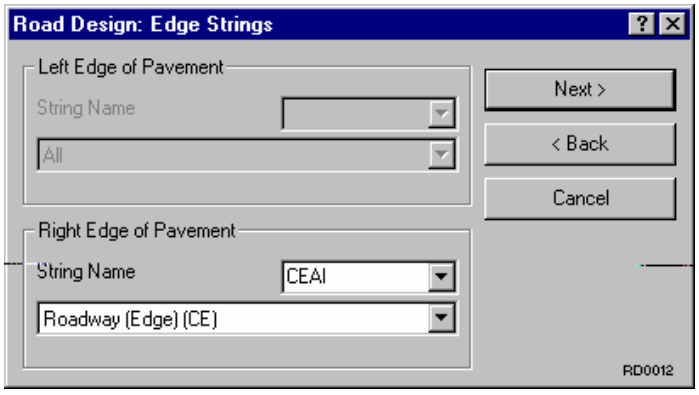
Note that the middle diagram in the illustration to the right, if applied to the right side, has no shoulder component. This would be an appropriate pick to apply to our mainline roadway which has already had a shoulder designed by other methods.

You also control which side of the reference string these features are added to by selecting the appropriate radio button on the left side.

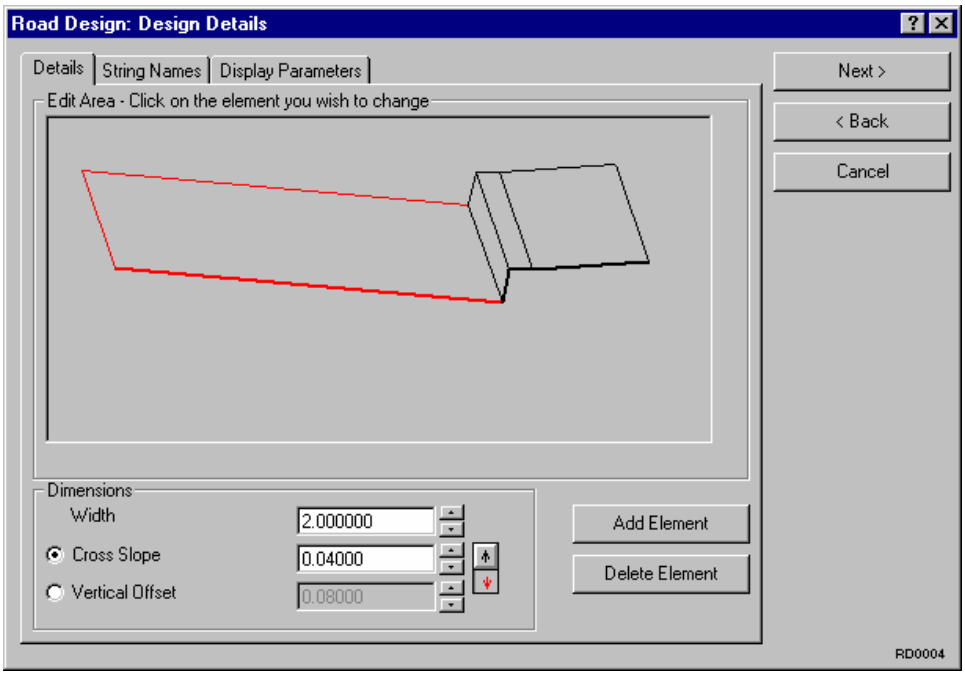
Step 3: Select the Edge Strings.

Note that for our example, we are only creating strings to the right of our reference string, so the top portion for the left side data is grayed-out.

Our right edge string name is also identical to our reference string, which is fine.

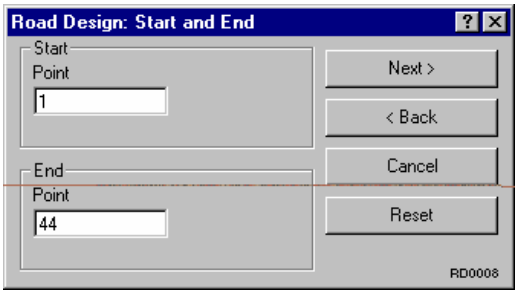


Step 4: Edit the template components if desired.



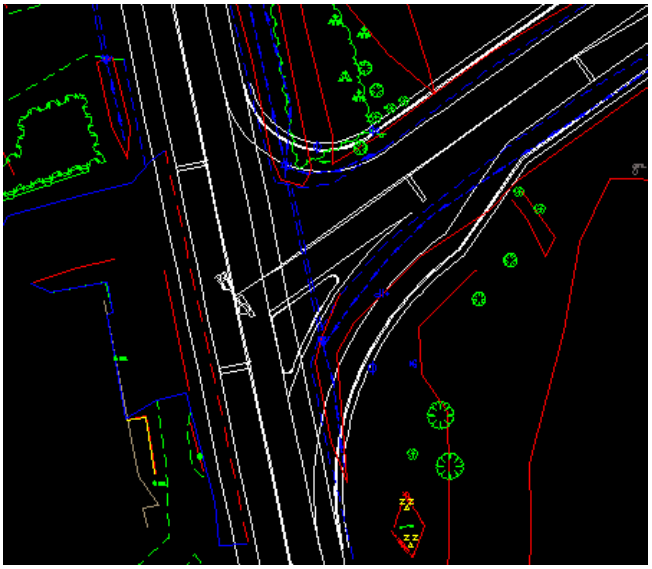
Here you can adjust the various element dimensions, add or delete elements, and in fact, create a whole new template for later use. If changes are made, you'll be asked if you would like to save this template for future use. Give it a descriptive name, and it'll be available for other projects, or to become an MDOT MX Master file (hint, hint).

Step 5: Specify the reference string limits which this template will be applied to. In the case of a Master Alignment reference string, it would be the station limits. In the case of the edge of travelled way or other feature string, it will be point numbers.



Click ***Next*** to create the strings.

Step 6: Repeat Steps 1 through 5 for the other side of the intersection. Our design should now look something like this:



All of the other intersections should be designed now, and the remaining curb and sidewalk strings are added to the main roadway. Add Discontinuities to your shoulder, curb, and sidewalk strings on your mainline roadway at the intersections. You could also add the curb and sidewalk strings to mainline earlier in the process, but they are not cleaned up as part of the Tidy Intersection automation, and you may find it easier to work through the wizards if you wait until you've completed the intersection design process, and added the shoulders and other template items to the side roads. All of these strings can be created with ***Design =>Design A String*** functions as well.